



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 491 977 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
11.05.2005 Bulletin 2005/19

(51) Int Cl.7: **G05B 23/02**

(43) Date of publication A2:
29.12.2004 Bulletin 2004/53

(21) Application number: **04014028.7**

(22) Date of filing: **15.06.2004**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL HR LT LV MK

- **Feldmeier, Gerry R.
Milwaukee Wisconsin 53212 (US)**
- **Liu, Yanzhen
Whitefish Bay Wisconsin 53217 (US)**

(30) Priority: **18.06.2003 US 479318 P**

(74) Representative: **Wagner, Karl H., Dipl.-Ing.
WAGNER & GEYER
Patentanwälte
Gewürzmühlstrasse 5
80538 München (DE)**

(71) Applicant: **EATON CORPORATION
Cleveland, Ohio 44114-2584 (US)**

(72) Inventors:
• **Durocher, David B.
West Linn Oregon 97068 (US)**

(54) **System and method for proactive motor wellness diagnosis based on potential cavitation faults**

(57) The present invention is directed to system and method for determining motor wellness based on potential faults including cavitation faults. Specifically, a controller (16) configured to detect indicia of motor faults. The controller includes a processor (18) configured to determine motor parameters (102, 104) of a given motor (12), generate a set of baseline data (126) for the given motor (12), and acquire current data from the given motor (12) during operation. The processor (18) is also

caused to isolate sidebands within the current data and map the current data (282, 276) within the sidebands to one of a plurality of bins (226). The processor (18) is caused to compare the current data within the sidebands to baseline data (322, 336) from the set of baseline data associated with the bin and determine a predictive fault index (322, 336) of the given motor prior to an actual fault occurrence.

EP 1 491 977 A3



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 01 4028

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 2002/186039 A1 (DEVANEY MICHAEL J ET AL) 12 December 2002 (2002-12-12)	1,5,14,15,18	G05B23/02
Y	* paragraph [0029] - paragraph [0045] *	2,3,6-12,16,17,19-21	
Y	----- WO 02/097545 A (WESTINGHOUSE ELECTRIC COMPANY LLC) 5 December 2002 (2002-12-05) * page 7, line 16 - line 21 *	2	G05B
Y	----- US 5 726 905 A (YAZICI ET AL) 10 March 1998 (1998-03-10) * column 2, line 18 - line 36 *	3	
Y	----- WO 01/01213 A (ROSEMOUNT INC) 4 January 2001 (2001-01-04) * page 6, line 6 - page 13, line 13 *	6,8-10,12,16,17,19,21	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
Y	----- EP 1 298 511 A (RELIANCE ELECTRIC TECHNOLOGIES, LLC) 2 April 2003 (2003-04-02) * paragraph [0063] - paragraph [0065] * * paragraph [0089] - paragraph [0090] *	6,7,10,11	
Y	----- US 6 330 525 B1 (HAYS COY L ET AL) 11 December 2001 (2001-12-11) * column 10, line 11 - column 12, line 45; figure 7b *	20	G05B
A	----- WO 02/091546 A (ANALOG DEVICES, INC; GETZ, ROBIN, LAURIE; HANRAHAN, DAVID, EDWARD) 14 November 2002 (2002-11-14) * page 9, line 16 - page 11, line 6 *	13	
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		2 March 2005	Kelperis, K
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
Y : particularly relevant if combined with another document of the same category		E : earlier patent document, but published on, or after the filing date	
A : technological background		D : document cited in the application	
O : non-written disclosure		L : document cited for other reasons	
P : intermediate document		& : member of the same patent family, corresponding document	

2
EPO FORM 1503 (03.02) (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 01 4028

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-03-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002186039 A1	12-12-2002	EP 1421670 A1 WO 02089305 A1	26-05-2004 07-11-2002
WO 02097545 A	05-12-2002	WO 02097545 A1 US 2003005486 A1	05-12-2002 02-01-2003
US 5726905 A	10-03-1998	CA 2204195 A1	01-11-1998
WO 0101213 A	04-01-2001	US 6601005 B1 AU 5302700 A EP 1190282 A1 JP 2003503784 T WO 0101213 A1 US 2004024568 A1	29-07-2003 31-01-2001 27-03-2002 28-01-2003 04-01-2001 05-02-2004
EP 1298511 A	02-04-2003	EP 1298511 A1	02-04-2003
US 6330525 B1	11-12-2001	US 6260004 B1	10-07-2001
WO 02091546 A	14-11-2002	US 2003006724 A1 JP 2004533799 T WO 02091546 A2	09-01-2003 04-11-2004 14-11-2002

EPO FORM P 0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82